



The Influence of Personality Traits, Rationality, And Self-Efficacy Towards Decision-Making Styles Among Technical Trainees

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Abstract: One of the qualities that employers often observe in potential graduates is the ability to display soft skills such as decision-making. It is suspected that some personality traits, cognitive domains, and efficacy have some effects on individual decision-making. Such awareness is expected to help technical trainees establish improved decision-making styles later that could have a positive professional impact. The aim of this study is to identify the domain of personality traits, rationality tendencies, self-efficacy and the combination of predictors that affect the decision-making style of trainees in technical training institutions. This study was conducted using survey quantitative design as the data collection tool. A population of 740 full-time trainees in electrical engineering from eight public technical training institutes were selected and 591 were identified using stratified random sampling technique. Data was collected using the Big Five Inventory (BFI), Rational-Experiential Inventory (REI), General Self-Efficacy Scale (GSES) and Maximization Scale. Based on multiple regression analysis, it is concluded that self-efficacy is the strongest predictor affecting decision-making styles among trainees at technical training institutions, as opposed to rationality, personality traits or a combination of predictors. This implies that self-efficacy has a profound effect on decision-making style. It could lead the trainee to make decisions based on his own experiences, rather than abiding safety rules and standard operating procedures. The trainees should realize decisions solely based on past convictions and experiences could cause detrimental effects on employers and themselves.

Keywords: Decision making, personality traits, rationality, self-efficacy, technical trainees

1. Introduction

As part of the Malaysian education system, the technical training system has clearly been criticised for failing to deliver the qualified labour force needed by the industry. The National Economy Advisory Council (MPEN) found that some of cognitive skills that are required by the employer are not completely infused into the technical training framework successfully (New Economic Model for Malaysia, 2010). To date, employers still need employees with soft skills such as leadership, self and time management beyond 'hard' knowledge and technical skills (Rhew, Balck & Keels, 2019). The ability to show soft skills and attitudes such as confidence, decision-making skills, the ability to learn and draw on experience are among the characteristics that employers frequently observe at prospective graduates (Herbert et al, 2020). The question of whether a person uses soft skills or not depends on many factors. One of them are reasoning, i.e., the logical processes of an inductive or deductive character used to draw conclusions from facts or premises (Vandenbos,

2015). Economic recovery efforts will have a negative effect if the technical training system in Malaysia is unable to resolve the problem (New Economic Model for Malaysia, 2010).

The current job market needs people with numerous soft skills as well as technical abilities. Rahmah Ismail, Ishak Yussof and Sieng (2011) found that humanistic quality was at least equal to individual technological capabilities in the labour market in many developed countries such as Australia, the United States and Canada. This is consistent with the study by Hussain et al. (2008), which shows that employers see the field of humanity as very significant, especially in producing trainees with exceptional soft skills and admirable morals. The mastery of such skills will increase the value of employability among graduates of technical training institutions. In the context of job market, employers are found to remain prioritising prospective employees with certain personality qualities (Haylock & Kampkötter, 2019). Internal attributes like efficacy, on the other hand, have been proven to influence certain behaviours such as decision-making. These factors are known to be related to harmful behaviours in high-risk careers like electrical engineering (Austin et al, 2020). These make studies concerning decision-making an important subject since it also associated with other work-related abilities.

2. Problem Statement

Due to its serious impact on one's future, the issue of decision-making receives serious attention, especially in career guidance and counselling (Pečjak, Podlesek & Pirc, 2019). Decision-making is a cognitive process of choosing between two or more alternatives, ranging from the relatively clear cut to the complex (VandenBos, 2015). However, the initial intervention at school level with guidance and counselling is also deemed inadequate to help young people address the problem before it eventually progresses into the area of work (Birol & Kuralp, 2010). Such circumstances not only impact the career landscape of the person, but possibly affect the lifestyle, social and economic environment.

In addressing these issues, educational institutions have developed structured systems of intervention through guidance and counselling services at all levels. Realizing that trainees need to be supported to make the best choices, assistance and advice is given to those who need it. One of the roles of counselling is to help trainees overcome a range of decision-making problems, such as decision-making difficulties (Saka & Gati, 2007; Hirschi, Niles & Akos, 2010), weaknesses of mental capacity (Krieshok, Black & Mckay, 2009), age differences and intellectual affordability (Baiocco, Laghi & D'Alessio, 2009), as well as interest and self-efficacy (Tracey, 2010). Past studies have shown that many variables such as personality and emotions (Saka & Gati, 2007); personality mismatches (Hirschi, Niles & Akos, 2010), shortcomings of reason and intuition processes (Krieshok, Black & Mckay, 2009) and inconsistencies between interest and efficacy (Tracey, 2010) have been closely related to decision-making problems.

These variables, including personality, facilitate individuals in making decisions in both life and work. Personality refers to a consistent pattern of characteristics and distinctive features that make the behaviour of a person consistent and distinctive (Feist, Feist & Roberts 2018). Ülgen, Saglam and Türker Tugsal (2016) study correlates certain personality traits with specific decision-making styles in achieving rational judgments and execution of functions. Studies by Brown, Abdallah and Ng (2010) show that the inclination of the person to choose and take action, including decision-making, is linked to personality traits. Other findings, including Parker, de Bruin and Fischhoff (2007) and Purvis, Howell and Iyer (2011), have found that personality characteristics play a role in assessing individual attitudes to make maximum profitable decisions. The new policies developed, such as better jobs based on their abilities, would greatly benefit trainees who recognize the characteristics of their personalities and abilities in decision making. This is indicated in the Second Strategic Transformation Initiative under the New Economic Model (New Economic Model for Malaysia, 2010).

A study by Godek and Murray (2008) found, in addition to personality traits, that the inclination of individuals towards rationality influences the degree to which individuals are willing to strive for optimum production. In other words, when making decisions, an individual's tendency to prioritize maximum gain can be attributed to his degree of rationality. Török, Pomiechowska, Csibra, and Sebanz (2019) also found that rationality affects the tendency of production efficiency and minimizes costs when individuals acted as a group. Rationality is the quality of being reasonable or of being open to reason (VandenBos, 2015). Rationale, which is the fundamental word for this concept, provides a descriptive image of the capacity of a person to perform heightened mental functions, evaluate reality or at least explain causes of something by prioritising cognitive over emotion.

The degree to which self-efficacy influences the tendency of a person to make decisions for optimum earnings requires empirical study. Self-efficacy defined as an individual's subjective perception of his or her capability to perform in a given setting or to attain desired results. Albert Bandura proposed self-efficacy as a primary determinant of emotional and motivational states and behavioural change (VandenBos, 2015) which seen as a significant factor in helping individuals make decisions. Positive relationship between self-efficacy and certain job fulfilment was found to be related to the ability to meet the needs and expectations of one's career (Ngo and Hui, 2018). Lai's (2010) earlier notes that self-efficacy, even with the existence of other predictor factors such as job performance and internal motivation, affects the inclination of an individual to make decisions for maximum achievement. In addition, knowledge is also an essential element that will assess an individual's degree of competence in making decision (Sanford, Schwartz & Khan, 2020).

Awareness of personality traits, tendencies in rationality and levels of self-efficacy is expected to help trainees form better styles of decision-making and have a positive impact on others in social or professional relationships. This awareness would also help them solve human resource problems under their guidance as trainees enter the world of

employment later. As Baiocco, Laghi and D'Alessio (2009) have noted, understanding the decision-making style can address the question of the variety of processes used by individual groups when faced with similar circumstances. Awareness regarding the relationship between decision-making style and consistent factors such as personality can help a person to become more effective in his daily functions, although the effects of certain mediators could be different (Othman et al., 2020). Since soft skills are considered essential and necessary for technical trainees, it is necessary to study the impact of factors discussed earlier with a decision-making style, especially in the context of education and training in Malaysia. The objectives for this study are to identify:

1. the personality traits, tendency in rationality, level of self-efficacy and decision-making styles of trainees in technical training institutions.
2. the effect of personality, rationality, self-efficacy, and combination of predictors on decision-making style of trainees in technical training institutions.

3. Methodology

This study was conducted using quantitative design with survey as the method of collecting data. Four variables used were predictors, namely personality traits, rationality, and self-efficacy, while decision-making style was the criterion. The personality trait defined in this study is focused on the Five Factor or Big Five personality model. This model divides traits into five major forms: neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness. Although the model has developed multiple times, this study uses the definitions by Costa and McCrae (Zhang, 2006).

In this study, rationality as the second variable focused on the capacity of the person to perform mental functions leading to the reasoning and evidence process by using cognitive capacities rather than based solely on experience inferences as defined by Epstein (2003). The third variable, self-efficacy as defined by Bandura (Gallagher, 2012) is associated with feelings and beliefs about the ability to cope with different challenges of everyday life, in particular the general self-efficacy as described by Scholz, Gutiérrez-Doña, Sud, and Schwarzer (2002). This study also focuses on the style of decision-making. Although it is possible to highlight different decision-making styles, the analysis focuses only on maximiser and satisficer decision-making styles introduced by Schwartz et al. (2002).

A population of 740 full-time trainees in electrical engineering from eight public technical training institutes across Malaysia were selected for this study. This population was chosen because it enables graduates to engage in their career at the supervisory level in decision-making. 591 was identified as sample using stratified random sampling technique. Generally, the location of the institutes can be divided into urban ($n= 261$) and rural ($n= 330$) areas. Since three predictors were involved in this study, the number of samples was calculated as indicated by the Green (1991).

Four separate instruments were used to collect the data. John, Donahue and Kentle's Big Five Inventory (BFI) (John & Srivastava, 1999), which was based on a five-factor personality model, was used to assess personality. This measuring instrument consists of 44 items divided into five dimensions: neuroticism, extroversion, openness to experience. Each dimension contains between eight to 10 positively or negatively rated items. The number of items in each dimension is unequal since some items use the same trait marker and are either used in a positive or negative form in one of the dimensions (Soto et al., 2011). Dimensions that achieve higher scores are considered to represent a more dominant individual characteristic. For the translated version of BFI used in this study, the reliability is .70.

Epstein and colleagues' Rational-Experiential Inventory (REI) was used to measure information processes from two separate systems, namely the rational system and the experience system. (Pacini & Epstein, 1999). This instrument consists of 40 items with 20 items measuring rational system while another 20 items measure experience system. REI used a five-point Likert scale with 21 items rated as positive, while another 19 items were rated as negative. A five-point Likert scale with 21 items scored positively, while another 19 items were scored negatively. For positive items, 1 point for 'completely false' option, up to 5 points for 'completely true' option. For items that are scored negatively, the opposite is the case. For the translated version of REI used in this study, the reliability is .75.

Schwarzer and Jerusalem's General Self-Efficacy Scale (GSES) was used to anticipate the response and adaptability of individuals to challenges after experiencing different stresses in life (Scholz et al., 2002). This instrument is comprised of 10 items. The GSES uses four types of response indicators, unlike REI, that allow respondents to select responses on whether 'not true at all', 'hardly true', 'moderately true' or 'exactly true'. In GSES, there are no negatively calculated scores. For this instrument, the composite score is determined from the sum of all scores that represent the items as answered by the respondents. As such, the GSES score is within the range of 10 to 40. For the translated version of GSES used in this analysis, the reliability is .85.

The Maximization Scale by Schwartz et al. (2002) was used to assess the decision-making style, as it was designed to evaluate the individual's tendency to maximize the results when faced with a task or circumstance. Using a 7-point Likert scale from "completely disagree" to "completely agree" on each statement, this instrument consists of 13 items. The average of overall scores specifies whether an individual is a maximizer or a satisficer. Individuals that obtain a score between 0 and 2.4 are rated as highly satisficer; 2.5 to 3.9 as satisficer; 4.0 to 5.4 as maximiser; and 5.5 to 7.0 as extreme maximiser. Higher scores indicate the tendency of the person to maximise profits. The translated scale has a reliability of .77. The research framework is as in Figure 1

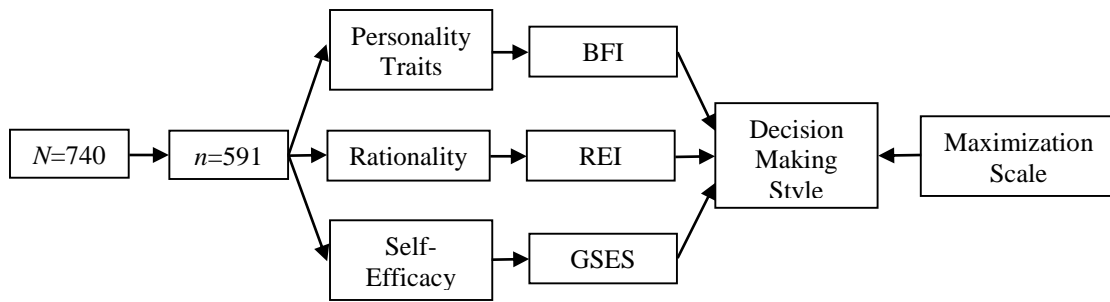


Fig. 1 - Research framework of the study

4. Result

4.1 The Personality Traits, Tendency in Rationality, Level of Self-Efficacy of Trainees in Technical Training Institutions

The findings show a wide distribution of data with discrepancies of 63 between the minimum and maximum value ranges for personality traits. The mean value for personality traits is 146.49; median is 146.00; and mode is 152. The values indicate that the distribution of personality traits is normal. Table 1 displays the frequency, percentage, mean and standard deviation for the dominant personality trait variables among the respondents. The dominant trait was 'openness to experience' with a total of 184 (31.1 %) respondents. Another 348 (58.9 %) respondents were dominant for 'agreeableness', while 59 (10.0 %) respondents were dominated by 'conscientiousness' traits. The findings revealed that the traits of 'neuroticism' and 'extroversion' were not highlighted by any of the respondents as the dominant traits. These findings also indicate that the number of respondents with the dominant 'agreeableness' traits is the highest relative to the smaller neuroticism and extroversion group. The overall results of the analysis according to the five traits of personality are as shown in Table 1.

Table 1 - Five traits of personality

Dominant Traits	Frequency	Percentage	Mean	Standard Deviation
Neurotism	-	-	-	-
Extroversion	-	-	-	-
Opennes to Experience	184	31.26	32.3	5.6
Aggreeableness	348	58.9	34.2	3.7
Conscientiousness	59	10.0	31.0	4.8

The difference between the rationality range of the minimum and maximum value is 114, while the standard deviation is 13.58. The mean value is 128.1, while median and mode are 128 and 123, respectively. The three adjacent values suggest that the distribution of is close to the normal distribution. The findings also show that the inclination towards the system of rationality was highlighted by a total of 284 (48.1%) respondents, while the other 307 (51.9%) were towards the system of experience. These findings indicate that with a difference of 3.8%, the number of respondents with a rationality system is lower. As in Table 2, the complete results are according to the level of tendency in rationality.

Table 2 - Tendency in rationality

Tendency	Frequency	Percentage	Mean	Standard Deviation
Rationality	284	48.1	63.98	6.5
Experience	307	51.9	64.10	9.0

Descriptive statistical results for variables of self-efficacy imply a less comprehensive distribution of data. The discrepancy between the minimum and maximum value levels (27) and the standard deviation of 5.16 illustrates this. The mean of self-efficacy is 29.1, median value is 29, and mode is 28. The three interrelated values suggest that the distribution is close to the normal distribution for various levels of self-efficacy. The findings revealed that a high degree of self-efficacy was exhibited by 437 (73.9%) respondents, while another 154 (26.1%) had a low level of self-efficacy. These findings also indicate that with a difference of 47.8%, the number of respondents who have a high degree of self-efficacy is greater than the level of low self-efficacy. As in Table 3, the complete results are according to the level of self-efficacy.

Table 3 - Level of self-efficacy

Self-Efficacy	Frequency	Percentage	Mean	S.D
High	437	73.9	29.1	5.16
Low	154	26.1		

A wide distribution of data with differences between minimum and maximum value is 61 and the standard deviation is 11.60. Descriptive statistical findings for the decision-making style indicate a wide distribution of data. The mean value for the decision-making style is 60, 61.0 for median and 52 for mode. The three adjacent values suggest that there is a near normal distribution for decision-making style. The findings showed that 118 (20.0%) respondents had a decision-making style of extreme maximiser. Another 350 (59.2%) respondents also identified with maximiser style of decision-making. A total of 121 (20.5%) respondents exhibited satisficer style of decision making. The remaining 2 (0.3%) respondents indicate extreme satisficer decision-making style. As in Table 4, the complete results of the analysis are in accordance with the decision-making style.

Table 4 - Decision making styles

Decision Making Styles	Frequency	Percentage	Mean	S.D
Extreme Maximizer	118	20.0	60.47	11.60
Maximizer	350	59.2		
Satisficer	121	20.5		
Extreme Satisficer	2	0.3		

4.2 The Effect of Personality, Rationality, Self-Efficacy, And Combination of Predictors On Decision-Making Style of Trainees in Technical Training Institutions

To study the effect of personality traits, rationality, self-efficacy, or combination of predictors on decision-making style, stepwise multiple regression was performed. Self-efficacy was included in the regression equation in Model 1 and was found to affect the decision-making style significantly ($F(1,589) = 33.19, p < .05$). For the self-efficacy predictor, the multiple regression coefficient (β) was .23 and explained the 5% variance ($R^2 = .053$) in decision-making style.

On Model 2, in addition to rationality, self-efficacy is included in the regression equation and found to influence the decision-making style significantly ($F(5,588) = 30.04, p < .05$). Multiple regression coefficients (β) are the same as .20 for self-efficacy and rationality, respectively. This result shows that 9% of the variant ($R^2 = .093$) is explained by a combination of self-efficacy and rationality predictors in the decision-making style with a variance difference of 4% compared to Model 1.

Self-efficacy and rationality were included in the regression equation in Model 3 along with personality traits and were found to have an important effect on the decision-making style ($F(3,587) = 26.68, p < .05$). The self-efficacy multiple regression coefficient (β) is .17, rationality is .21, while the personality traits is .17. These results show that in decision-making style, the combination of self-efficacy, rationality and personality traits explains a 12% variance ($R^2 = .120$) with 7% variance discrepancy compared to Model 1.

Based on these multiple regression coefficients, it can be concluded that self-efficacy, as opposed to rationality, dominant personality traits or a combination of predictors, is the strongest predictor influencing decision-making styles among trainees of technical training institutions. For the self-efficacy predictor, the multiple regression coefficient (β) was .23 and explained 5% variance ($R^2 = .053$) in decision-making style. This result is described in Table 5.

Table 5 - Multiple regression (n=591)

Model		B	S.E	B	T	p
1	(Constant)	45.37	2.66		17.0	.00
	Self-efficacy	.52	.09	.23	5.76	.00
2	(Constant)	25.27	4.76		5.31	.00
	Self-efficacy	.46	.09	.20	5.12	.00
	Rationality	.17	.03	.20	5.05	.00
3	(Constant)	3.78	6.88		.55	.58
	Self-efficacy	.37	.09	.17	4.10	.00
	Rationality	.18	.03	.21	5.35	.00
	Personality trait	.16	.04	.17	4.27	.00

Note: Model 1: $R^2 = .053$; Model 2: $R^2 = .093$; Model 3: $R^2 = .120$ ($p < .05$)

5. Discussion

The results indicate that there are three dominant personality traits (openness, agreeableness, and conscientiousness), two rationality tendencies (rationality and experience), two self-efficacy levels (low and high), and four decision-making styles (extreme maximizer, maximizer, satisficer, and extreme satisficer) among trainees in technical training institutions, consequently achieving the study's primary goal.

As for the second objective, this study found that self-efficacy strongly influences individual decision-making style, compared to personality traits and rationality. These results were found to be consistent with many other studies examining the effect of variables on decisions made by individual. A study by Peterson and Whiteman (2007) on the relationship between aspects of self-efficacy and personality, including personality traits, found that assessment of self-efficacy is more capable of detecting the degree to which individuals adopt general abilities compared to personality factors, including traits that relate to individual behaviour.

The current findings were also found to be consistent with Larson et al. (2010) in the sense of taking action, including making choices and decisions. The study found that self-efficacy, in terms of behaviour in choosing, is a greater determinant than personality. Although the personality element plays a role during individual actions, such as in decision-making, this situation demonstrates that self-efficacy is still a factor that has a greater effect. Self-efficacy was also found to be a factor that influences more certain individual behaviour, especially in achieving a specific goal (Diaconu-Gherasim, Măirean & Brumariu, 2019).

The results of this study are also consistent with the findings of a study by Muhammad Bazlan Mustafa et al. (2010) in Malaysia. The study found that with certain behaviour, particularly depression, there was a relationship between several factors, including personality and self-efficacy. The study found that self-efficacy is more effective than other variables, including personality traits, in affecting individual actions and emotions, which have a certain effect on the course of action of the individual, either from a cognitive or behavioral point of view. Since cognitive processes and behavioral patterns are included in the decision-making style, these results are consistent with this finding.

In discussing the relationship between the variables of self-efficacy and rationality, Ogilvie and Stewart (2010) found that in making decisions, self-efficacy is more influential than rational-based explanations in individual behaviour. It was found that disparities in the degree of self-efficacy have different effects on the decisions made. These circumstances suggest that in decision making, self-efficacy plays a more important role and is consistent with the results of this study.

A study by Reed, Mikels and Löckenhoff (2012) found that certain levels of self-efficacy, especially low self-efficacy, significantly inhibit people's motivation to conduct the information-seeking process and take into account different alternatives in making complex decisions. In other words, in decision-making, self-efficacy has a strong impact on processes involving rationality. This was also found to be consistent with findings of Reed et al. (2012).

Self-efficacy has proved to be the most influential decision-making style relative to personality characteristics and rationality. This should be a factor that needs to be seriously considered by the technical institution since self-efficacy influence trainees' behaviour pattern which determine their decision-making style. Self-efficacy needs to be considered in applying instructional process, so that trainees are aware of how these variables impact their attitudes and behaviour. They should also be conscious that certain degree of self-efficacy can hampered the process and even lead trainees to resist assistance. Therefore, to help technical trainees make decisions that fit their needs, all parties involved need to find ways to improve self-efficacy as well as to strengthen aspects of personality and rationality. The effect of self-efficacy on decision-making can also be studied further in particular sub-areas, such as learning-related self-efficacy, work-specific self-efficacy, and others. Studies in such sub-fields and their effect on decision making will help enhance the technical education system and further increase the quality of graduates as needed by the industry.

6. Conclusions

In conclusion, this finding suggests that self-efficacy has the greatest effect on decision-making style versus rationality and personality. These results offer the impression that technical trainees' decision-making style is more deeply affected by the belief in one's ability to deal with different circumstances. This should be noted because if the trainee ventures into high-risk areas such as electrical engineering, self-efficacy alone may lead the trainee to make task-related decisions primarily based on his own experience and take safety rules and standard operating procedures lightly. This can pose a number of safety risks to oneself and others. The training provider should also re-examine the focus on the application of values to trainees. Decisions based on previous convictions and experiences alone may not always produce precise results. When completing a task, understanding that self-efficacy is not adequate in making risky decision can lead to a more vigilant attitude among trainees. This is critical as misjudgments may lead to serious injuries which can in the future have a detrimental effect on trainees and employers. The current study was limited by a number of factors. First, this study's sample was limited to trainees on a specific course. Other technical courses that demand strong safety practices, such as oil and gas, should be considered in future studies. Second, this study takes a quantitative method, which restricts the data quality. Finally, all of the data used in this study comes from a single source (i.e., electrical engineering trainees). Additional information can be obtained by consulting various sources of information, such as parents and technical instructors.

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